

DEPARTMENT OF WATER RESOURCES

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TO: Distribution List

The Supplemental Report of the 2007-08 Budget Act (Item 3860-001-0001), requires the Department of Water Resources (DWR) to prepare a report on its plan for implementing the recommendations in the CALFED Independent Panel on Agricultural Water Use Report of 2004.

The attached report provides information to the Legislature regarding water measurement in fulfillment of these Supplemental Budget Report requirements. This report is submitted in compliance with these requirements.

If you have any questions, please contact me at (916) 653-7007 or your staff may contact Rick Soehren, Chief, Office of Water Use Efficiency and Transfers, at (916) 651-7051.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Lester A. Snow', with a long horizontal flourish extending to the right.

Lester A. Snow
Director

Attachments

Department of Water Resources

SUPPLEMENTAL BUDGET REPORT

Background

In 2001, the California Bay-Delta Authority (CBDA) convened an independent panel of experts to help define appropriate agricultural water use measurement, in fulfillment of a commitment in the CALFED Record of Decision. In September 2003, the panel issued its final report. The report included four major recommendations:

- Farm-Gate Measurement: Require districts to report delivery data to the State.
- Groundwater Use Measurement: Employ more precise methods to compute and report net usage to the State.
- Crop Water Consumption Measurement: Measure using satellite-generated remote sensing.
- Surface Water Diversion Measurement: Measure all major surface water diversion using the best available technologies and report data to the State.

The panel also stressed that any implementation approach must be adaptive, include appropriate exemptions, and allow for local flexibility and creativity.

In April 2004, CBDA staff prepared a proposed Implementation Approach for Agricultural and Urban Water Use Measurement. This approach reiterated the recommendations of the expert panel on agricultural water use measurement and added several recommendations based on CBDA staff work and stakeholder meetings:

- Require urban water suppliers above a certain size threshold to measure service water deliveries.
- Develop and maintain a coordinated database among the State agencies currently collecting water supplier water use data.
- Undertake a research and adaptive management program.

CBDA staff also acknowledged in the staff report that implementation of the recommendations would be costly. The initial estimate exceeded \$8.3 million per year for State agencies and local costs of over \$1.1 million per year, exclusive of the costs for urban water metering.

Urban Metering

Since the spring of 2004, the Legislature has proposed and the Governor has signed several provisions that incrementally implement the CALFED recommendations. In September, 2004 the Governor signed AB 2572 (Kehoe) which will require urban water suppliers to install water meters on all municipal and industrial water service connections by 2025 and charge based on the actual volume of deliveries.

Coordinated Database, Farm Gate Measurement, Surface Water Diversion Measurement

In October 2007, Governor Arnold Schwarzenegger signed AB 1404 (Laird) into law. This bill enacts or outlines the next steps for several of the CALFED measurement recommendations. It requires DWR, the State Water Resources Control Board, and the Department of Public Health to evaluate the feasibility, estimated costs, and potential means of financing a coordinated water measurement database. The bill also requires agricultural water suppliers to report aggregated farm-gate deliveries to DWR. In addition, the bill requires surface water diversion measurement to use the "best available technologies."

Groundwater Use Measurement

DWR supports the collection and dissemination of groundwater data to provide for more effective management by local groundwater users, and is taking a number of steps to more effectively use groundwater measurements that are already collected. As a part of the update of the California Water Plan, a systematic method is being developed to use groundwater level data to calculate annual changes in storage in the major groundwater basins of the state. DWR is also developing an Integrated Water Resources Information System (IWRIS) that provides access to numerous data sources in several State, federal, and local agencies through a common, map-based interface. The system is scheduled to be released for public use in the first half of 2008.

Since passage of AB 303 (Thomson) in 2000, the Local Groundwater Assistance Act has provided nearly \$28 million in grants to local agencies to conduct studies, implement groundwater monitoring, and develop groundwater management plans. This program will once again award grants in FY 2007-08 following two years without funding. The program has provided extensive water quality and water level data, an increased understanding of groundwater basin conditions, and improved management in groundwater basins throughout the state.

The Legislature has passed three versions of legislation to require groundwater measurements. However, in the current fiscal conditions faced by the State, costs associated with implementation of these bills have exceeded levels that could be absorbed by DWR programs, and therefore were not signed into law. DWR will continue to work with the Legislature to develop legislation that has broad support of the groundwater user community and adequate funding to carry out program activities.

Crop Water Consumption Measurement, Research

The CBDA Independent Panel additionally issued the recommendation that the method of measurement of agricultural crop water use should be updated to use satellite-generated information. DWR believes that great opportunity lies in this recommendation, however, in addition to current DWR efforts, greater research is needed and is planned by the department. Currently, DWR determines evapotranspiration of crop water using the land use method. This method uses climatic

information from automated weather stations and crop-specific water use coefficients to estimate crop evapotranspiration. DWR operates more than 120 of these weather stations as part of the California Irrigation Management Information System (CIMIS), and also receives data from other agroclimatic stations that are not part of the DWR program. In October 2007, Governor Schwarzenegger signed AB 566 (Plescia) into law. This bill requires DWR to develop a standard protocol for evapotranspiration data, it formally establishes CIMIS in statute, and it directs DWR to expand CIMIS as funding is made available.

In recent years, different researchers and vendors have developed methods of using data received through satellite sensing, rather than weather station and crop type, to estimate crop evapotranspiration. DWR is not at present using such methods, but has been evaluating the accuracy and potential use of this. Current analysis of one of these methods, from a small data set developed through a CALFED grant, indicates that the estimates developed are close to existing DWR estimates. As a result, DWR will continue to pursue research to determine if and how satellite sensing information can be used in DWR's water use program.

Currently, this technology, and the data it produces, is only available through a few vendors, and at a high cost. To develop data in-house, this technology requires staff with knowledge and experience with remote sensing and classification of satellite data, which DWR does not have at present. Utilizing the close working relationship that DWR has with the United State Bureau of Reclamation's Mid Pacific office, which has remote sensing software and staff expertise, DWR will continue evaluation of this evapotranspiration measurement method.

One major concern about this technology is not the methods themselves, but the availability of satellite imagery. The satellite data that are used include both multi spectral and thermal imagery. The two most accessible and inexpensive datasets are those from the two Landsat satellites. Unfortunately, the most recently launched Landsat satellite is approximately seven years old and has experienced significant technical problems, making available data almost useless. Additionally, in late summer 2007, the other Landsat satellite which is over 20 years old, quit sending data altogether. The next Landsat series satellite is planned to be launched in 2011, and may not include the costly thermal sensor that is essential for these evapotranspiration data collection methods.

If data from the two existing Landsat satellites do not again become available, and no new data can be received from the next generation satellite, future work will be uncertain.

Conclusion

California has made significant progress in the last few years with respect to measurement of water use. Recent legislation sets the stage for additional improvement within the next few years. There are new technologies such as satellite remote sensing that offer the potential to improve our water use information and better inform water management decisions, but there are also significant technical and cost challenges associated with the widespread use of these technologies. Finally, the Legislature has identified a need for better information on groundwater resources and groundwater use. DWR will continue working to develop acceptable, useful and cost-effective approaches to accomplish this.